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The Effects of Drive and Ego-Involving Instructions upon Verbal Behavior During Delayed Auditory Feedback

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The Effects of Drive and Ego-involving Instructions Upon
Verbal Behavior During Delayed Auditory Feedback

by

Donald Edward Fuhrmann

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of the
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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	11
LIST OF TABLES.	iv
LIST OF ILLUSTRATIONS	v
 CHAPTER:	
I. Introduction.	1
A. Drive and the Manifest Anxiety Scale	1
B. Ego-involving Instructions	3
C. Delayed Auditory Feedback	4
D. Purpose and Hypotheses	6
II. Method.	7
A. Subjects	7
B. Apparatus	7
C. Stimulus Material	8
D. Instructions	8
E. Procedure	9
F. Dependent Variables	10
III. Results	11
IV. Discussion	22
V. Summary	28
VI. References	29

LIST OF TABLES

Table No.		Page
1	Means and Standard Deviations for Criterion and Covariate Scores	13
2	Adjusted Means for Total Time and Fourth Sentence Time	14
3	Analysis of Covariance of Total Time as Cri- terion and Verbal Intelligence as Covariate for Drive, Instructions and Feedback . .	16
4	Analysis of Covariance of Fourth Sentence Time as Criterion and Verbal Intelligence as Covariate for Drive, Instructions, and Feedback	19

LIST OF ILLUSTRATIONS

Figure No.		Page
1	Adjusted Means for Total Time	15
2	Adjusted Means for Fourth Sentence Time . .	20

CHAPTER I

INTRODUCTION

During the last fifteen years, many attempts have been made to specify and identify the impact which drive has upon behavior. Much of the research has dealt with the relationship between drive level and task performance. Subjects have usually been selected according to their level of drive, for example, according to their scores on the Taylor Manifest Anxiety Scale (Taylor, 1953). The tasks to which drive has been related are quite varied, ranging from eyelid conditioning (Taylor, 1951) to concept formation tasks (Siegman, 1956). The experiments have ranged from purely physiological measures to the more cognitive tasks. The research does not describe studies which relate drive to the peculiar verbalizations which are frequently elicited during delayed auditory feedback, hereafter referred to as DAF. It is the purpose of this study to investigate the effects of differing levels of drive, as well as the effects of differing levels of ego-involving instructions, upon verbal behavior during delayed auditory feedback.

Drive and the Manifest Anxiety Scale. The Taylor Manifest Anxiety Scale, hereafter referred to as the MAS, is a paper and pencil, self-report questionnaire which consists of Minnesota Multiphasic Personality Inventory items judged by clinicians to be associated with the overt expression of or the awareness of anxiety. The MAS has been fairly consistently utilized in the research literature as a measure of drive. The term drive will be used here to denote a hypothetical construct based upon persistent emotional

responsivity within the individual; that is, an hypothesized process that differentially energizes certain responses, making them dominant over other possible responses to the same stimulus. Regarding the relationship of the concept of drive to the MAS, Taylor (1956) stated that her interest is not in the investigation of anxiety as a phenomenon, but rather in the role of drive in certain learning situations. She even suggested that the measure might better be described as a test of emotionality. Later she indicated that the choice of the word "anxiety" to describe her scale was indeed inappropriate (Spence, 1963). Farber (1954) pointed out that no attempt has been made to claim that the only difference between individuals receiving different scores on the MAS is in drive level or that all performance differences could be attributed to differences in drive level. Spence (1958) suggested that drive is a function of the strength of the emotional response made by an organism to noxious stimulation. Subjects who score high on the MAS, those who possess high drive, could then be considered to be emotionally over-reactive to noxious stimuli. On the basis of this theoretical viewpoint, one might then be able to predict success or failure on tasks which necessitate the learning of an avoidance response. Spence (1958) also suggested that a person with high drive may perform poorly because of the presence of more perseverative and associative responses, since such responses would interfere with the eliciting of the desired or the correct response.

Generally, high drive subjects perform better than low drive subjects on simple types of tasks; e.g. they learn avoidance responses more readily, condition more quickly, and demonstrate greater resistance to extinction (Taylor, 1951; Spence and Taylor, 1951; Spence and Farber, 1953). However,

in complex learning tasks, high drive subjects perform more poorly than low drive subjects (Hunt and Cofer, 1944; Taylor, 1956). J. T. Spence (1963) pointed out that, under emotionally neutral conditions, high drive subjects were superior on verbal learning tasks with minimal intratask competition and inferior on tasks with high intratask competition. However, she also found that, when stress was introduced into the experimental situation, the drive hypothesis no longer could account for the performance decrement of high drive subjects, since stress cannot be considered to be a persistent emotional response within the individual. J. T. Spence utilized Child's (1954) hypothesis of response interference to explain the performance decrement as drive increases with stress. That is, as drive is intensified, the stimulus generalization gradient is broadened, allowing irrelevant responses to be pushed above the response evocation threshold. Therefore, as the number of possible response alternatives increases, there is an increasing tendency for irrelevant responses to interfere with relevant responses.

Ego-involving Instructions. Instructions which are used as independent variables during experimentation may be classified in several ways. First, the instructions may be subject-oriented. For example, the instructions may possibly suggest some threat to the subject's self-esteem. He may be informed that the experimental task reveals his intellectual capacities, thereby arousing high desire to appear as intelligent as possible. Other instructions which may be subject-oriented are reports of failure or success on the experimental task (Sarason, 1956), informing the subject that he may receive an electric shock (Silverman and Elitz, 1956) or placing the subject

under a time limit to complete the task (Sarason, Mandler and Craighill, 1952). Second, the instructions may be task-oriented, encouragement being given to the subject by emphasizing the importance, significance or the relevance of the experimental task. Third, the instructions may be examiner-oriented. For example, the subject may be encouraged to do his very best in order to help the examiner out of a difficult situation, such as that of completing his thesis. The purpose of each type of instruction is to stimulate the subject's involvement in the experimental task; i.e. to create ego-involvement.

It has been generally found that high drive subjects perform more poorly than low drive subjects when a task is difficult and when ego-involving instructions are given. Even though the Sarason Test Anxiety Scale correlates more highly with the behavioral effects of ego-involving instructions than does the Taylor MAS, the MAS was still found to be significantly related to the effects of instructions upon performance (Sarason and Palola, 1960).

Sarason (1961) utilized a response interference interpretation of the effects of ego-involving instructions. The subject becomes more and more involved in the experimental task, since the task performance represents a threat to his self-esteem. As the threat to the ego increases, anxiety and drive increase, allowing irrelevant responses to interfere with the relevant responses. This interpretation is similar to J. T. Spence's (1963) interpretation of the performance decrement in her high drive subjects.

Delayed Auditory Feedback. Delayed auditory feedback (DAF) is a method by which perceptual and behavioral confusion is created. Von Békésy and Rosenblith (1951) have specified that approximately one-half of the hearing

of one's own voice results from air conduction, the other half being a function of bone conduction and other proprioceptive cues. The method of DAF electronically delays the air conduction of the subject's voice (Fairbanks, 1955). As the subject speaks, he hears the vocal sounds two hundred milliseconds later through air conduction. Audition is thus distorted by hearing an "echo". Since the subject's auditory perception of his own voice is distorted, one might expect his speech to be distorted as well. When such perceptual cues which are taken for granted are disrupted, dramatic behavioral changes should be anticipated.

During DAF wide variations in verbal behavior occur, both between and within individuals (Fairbanks and Guttman, 1958). Some of these responses include the following: a greater length of time is needed to speak; vocal intensity increases; omissions and repetitions occur; mispronunciations and stuttering result (Lee, 1950; Fairbanks, 1955).

In an attempt to explain the process of vocal distortion during DAF, Mowrer (1960) suggested that words or vocalmotor responses are dependent upon sensory feedback from other perceptual fields while the vocalization is occurring. If this constant sensory feedback is interfered with, the speech will be disturbed. The ability to speak then seems to be a function of the balance between the subject's attention to internal, as well as to external, cues. During DAF, the ability to speak as one usually speaks appears to be a function of the ability to shift modes of behavior, to vary one's attention to internal or to external cues, to attend to kinesthetic or to air-conducted sound.

DAF then is a unique task which is neither purely physiological nor purely cognitive. It is neither a simple nor a complex task. It induces a

midly confusing experience by creating dissonance in previously consonant auditory cues. DAF allows a quantitative analysis of the vocal distortions if a tape recording is made.

Purpose and Hypotheses. The purpose of this study was to investigate the effects of drive and the effects of ego-involving instructions upon verbal behavior during delayed auditory feedback. Since DAF provides the subject with an experience which is quite dissonant, peculiar, and difficult to understand, the assumption can be made that DAF is a moderately difficult and moderately stressful task. All three variables then, drive, instructions, and feedback, may be considered as creating response interference. Using the response interference interpretation, the following hypotheses were generated. First, high drive subjects should perform more poorly than low drive subjects during the DAF condition. This prediction is expected since high drive subjects are apparently more reactive to noxious stimulation, are more susceptible to associative and perseverative responses, and are more prone to attend to irrelevant stimuli. No significant difference between drive groups should obtain during the control condition, since presumably no stress is created. Second, the ego-involving instructions should produce a significant main effect, with verbal behavior being more distorted during moderate and extreme instructions than during neutral instructions. Third, the performance of high drive subjects should be more effected by instructions than the performance of low drive subjects. Fourth, a significant main effect for the feedback condition should occur.

CHAPTER II

METHOD

The $2 \times 2 \times 3$ factorial design contained the following variables: drive (high and low); instructions (neutral, moderate, and extreme ego-involving); auditory feedback (delayed and control).

Subjects. The subject population consisted of male undergraduates enrolled in introductory psychology courses, who participated in the research in partial fulfillment of course requirements. They were assigned randomly to each of 6 groups, so that forty-five subjects were in each group. The experimental conditions for the 6 groups consisted of a DAF and a control group, each of which received either neutral, moderate, or extreme instructions. The subjects were further classified into high and low drive groups according to whether their scores on the Taylor MAS fell approximately into the upper or lower twenty per cent. This selection process provided between 8 and 11 subjects for each of the 12 cells with a total N of one-hundred fifteen subjects. The MAS was given as part of the Personal Reaction Schedule (Walker and Nicolay, 1963). The data was collected in the above fashion, that is, placing subjects into high and low drive groups after the experimental procedures were completed, in order to avoid any experimenter bias. Such a bias might arise from knowing whether a subject possessed high or low drive.

Apparatus. The subject was seated at a fixed distance from a Turner 200 microphone. As he read a short paragraph, his voice was transmitted into a Knight tape recording deck. The time necessary for the tape to pass from the recording head to the playback head was two-hundred milliseconds, the auditory

delay which creates the greatest amount of verbal distortion (Black, 1951; Fairbanks, 1955). The sound was then transmitted from the playback head to a Belltone 15C audiometer. At two-hundred milliseconds delay, the maximum disturbance of speech is achieved when the intensity of the feedback is thirty decibels above the normal conversational voice level feedback, which is approximately fifty decibels (Tiffany and Hanley, 1956). The audiometer therefore was preset at eighty decibels. The sound was then transmitted back to the subject's earphones. All the subjects' verbalizations were tape-recorded. During the non-DAF condition, the control condition, the verbalizations were fed directly into the recorder and into the audiometer without any delayed feedback. Although this apparatus could be seen by the subject when entering the experimental room, both the experimenter and the apparatus were hidden behind a screen during the experiment proper.

Stimulus Material. Each subject was asked to read the following paragraph which has frequently been used in DAF research:

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow" (Morrer, 1960).

Instructions. The instructions that were given to the subjects were intended to engender neutral, moderate and extreme ego-involvement.

Neutral: I would like you to read this paragraph aloud when I say "Begin". No matter what may occur during the experiment you should try to read as you usually do. Ready - begin.

Moderate: I would like you to read this paragraph aloud when I say "Begin". No matter what may occur during the experiment you should try to read as you usually do. Most people are able to read fairly fluently under these conditions. Remember, try to read as you usually do. Ready - begin.

Extreme: I would like you to read this paragraph aloud when I say "Begin". No matter what may occur during the experiment you should try to read as you usually do. Most people are able to read fairly fluently under these conditions. If for some reason you do not read the passage according to our expected level of performance, I'll explain to you, after the experiment, why certain, small and rather unusual groups of people have difficulty in coping with this type of experience. Remember, try to read as you usually do. Ready - begin.

Procedure. All subjects had taken the Taylor MAS as part of the initial testing in their introductory psychology courses. Also, verbal Scholastic Aptitude Test scores taken as part of the college entrance examinations were used, since distortions during DAF and verbal facility (intelligence) appear to be related (Arens and Popplestone, 1959). Upon entering the experimental room, each subject was seated and was asked to place the earphones on his head so that they fit comfortably. The instructions were then given, using the experimenter's microphones, and the paper covering the passage to be read was raised. When the subject began to read, a stop watch was started manually. The watch was also stopped when the passage was completed. The manual method of timing verbal responses during DAF was found to have a test-retest reliability coefficient of .99 (White, 1958). The subject was then asked whether or not he had ever experienced any hearing loss or had any speech problems. If so, that subject was not included in the sample. At the conclusion of the testing session, each subject was told the following:

Your performance on the experiment was within our expected levels of performance. It is very important that you do not discuss the experiment with your friends. Thank you.

Dependent Variables. The primary dependent variable was the time necessary to read the entire passage. Secondary dependent variables were: the time necessary to read the fourth sentence of the paragraph; the number of substitutions for words in the fourth sentence; the number of words omitted in the fourth sentence; and the number of words repeated in the fourth sentence. The fourth sentence was utilized, since it is located approximately in the middle of the stimulus paragraph and, therefore, might be representative of a subject's overall performance. Also, the subject would have perhaps overcome the initial novelty of DAF and would not yet have achieved his optimal performance expected at the end of the paragraph.

CHAPTER III

RESULTS

In order to assess the intrajudge reliability for the manual method of timing, a test-retest correlation was done. The manual timing proved to be quite acceptable, since the correlation was .99 for the total time and .91 for the timing of the fourth sentence.

Before any statistical analysis could be done, the normality or the skewness of the data had to be determined. Even though the F test is quite robust, the assumption of a normal distribution of scores should not be lightly made. Therefore, the scores were plotted graphically to determine, first by inspection, whether the distribution of scores was indeed normal. The total time scores appeared to be normally distributed, while the fourth sentence time scores seemed to take the shape of a Poisson distribution. An F_{\max} test showed that homogeneity of variance did exist for the total time scores, since $F_{\max} = 1.56$ and is not significant because $F_{\max.95} = 9.91$. However, in the fourth sentence time scores, there is heterogeneity of variance, since $F_{\max} = 38.51$ is significant at the .01 level ($F_{\max.99} = 18.9$). The intelligence scores were also plotted graphically and appeared to be normally distributed. The F_{\max} test confirmed this belief, ($F_{\max} = 7.71$, $F_{\max.95} = 11.7$). Therefore, since both intelligence scores and total time possessed homogeneity of variance, a parametric test was used. An analysis of covariance was employed. Since the time scores for the fourth sentence demonstrated heterogeneity of variance, two possibilities existed. The

scores could be transformed in order to normalize the distribution. Secondly, if the distribution is skewed, the F statistic would tend to maximize the significance of effects which were not at all significant. That is, more false positives would tend to obtain. Therefore, an analysis of covariance was done to determine how many factors would be significant. If several factors had been significant, then a transformation would have been done to normalize the distribution.

In order to note the influence of the covariate (intelligence) upon the criterion measures, the means and standard deviations for the criterion and covariates are presented in Table 1. The effect of the covariate upon the criterion was partialled out and is reflected in the adjusted means, as presented in Table 2. No method could be found either in Winer (1962) or in McNemar (1955) to derive the adjusted standard deviations.

The analysis of covariance for the total time scores as criterion and intelligence scores as the covariate, in addition to the testing of simple main effects, revealed the following information presented in Figure 1 and Table 3. First, only one significant interaction occurred for the total time measure. The drive x feedback interaction was significant at the .02 level ($F=6.21$, $F_{.98}=6.21$). An analysis of the simple main effects of the interaction indicated that, during DAF, high drive subjects performed significantly more poorly ($p < .001$) than low drive subjects. However, in the non-DAF control condition, there was no significant difference between the high and low drive groups. The significance of the drive x feedback interaction can be accounted for, then, by the poorer performance of high drive subjects during DAF and not by any differences in the non-DAF condition.

TABLE 1

Means and Standard Deviations for Criterion and Covariate Scores

<u>Feedback</u>	<u>Instruction</u>	<u>Drive</u>	<u>N</u>	<u>Total Time</u>		<u>Fourth Time</u>		<u>SAT</u>	
				<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Delayed	Neutral	Low	11	36.24	4.26	4.54	2.15	522.8	11.83
		High	10	42.66	17.47	5.22	2.45	556.8	10.54
	Moderate	Low	9	35.49	5.36	4.41	.87	555.6	4.69
		High	10	39.53	4.62	4.75	.69	515.9	9.59
	Extreme	Low	11	40.05	5.74	5.30	1.12	543.7	8.06
		High	10	46.24	19.24	5.60	2.40	510.3	6.93
Control (Non- delayed)	Neutral	Low	8	29.70	2.67	3.96	1.19	591.3	7.75
		High	10	29.36	4.18	3.81	1.20	551.4	5.74
	Moderate	Low	10	29.68	3.59	3.62	.55	507.9	7.07
		High	9	30.10	3.27	3.72	.41	567.0	11.92
	Extreme	Low	9	32.79	6.45	4.06	1.05	508.4	9.00
		High	8	29.89	2.12	3.97	.63	519.6	5.74

Table 2: Adjusted means for total time
and fourth sentence time.

<u>Feedback</u>	<u>Instruction</u>	<u>Drive</u>	<u>Total time</u>	<u>Fourth time</u>
Delayed	Neutral	Low	36.92	4.58
		High	41.78	5.16
	Moderate	Low	34.66	4.35
		High	40.53	4.82
	Extreme	Low	39.77	5.28
		High	47.50	5.69
Control (non-delayed)	Neutral	Low	27.23	3.79
		High	28.73	3.77
	Moderate	Low	31.05	3.71
		High	28.75	3.63
	Extreme	Low	34.13	4.15
		High	30.72	4.03

FIGURE 1: ADJUSTED MEANS FOR TOTAL TIME

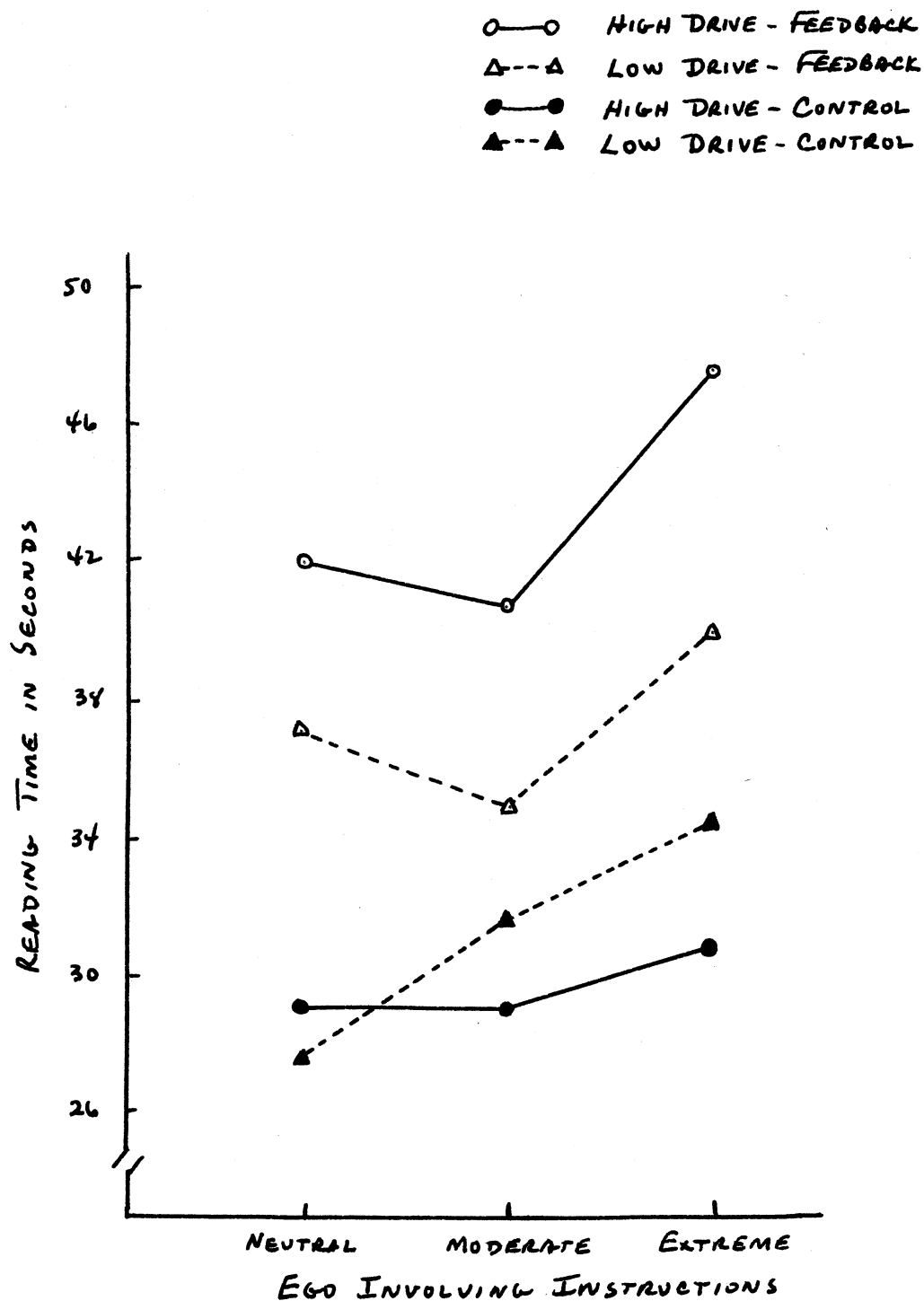


Table 3: Analysis of covariance of total time as
criterion and verbal intelligence as covariate for
drive, instructions, and feedback.

	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Drive (D)	1.60	1	1.60	2.39
Instructions (I)	4.63	2	2.32	3.46*
Feedback (F)	28.86	1	28.86	43.07***
D x I	.99	2	.49	.73
D x F	4.16	1	4.16	6.21**
I x F	.46	2	.23	.34
D x I x F	1.00	2	.50	.75
Error	68.73	102	.67	

* $p = .05$

** $p = .02$

*** $p = .001$

Second, a significant main effect due to instructions ($p = .05$) is also evident. An analysis of the simple main effects indicate that the moderately ego-involving instructions (c_2) did not differ significantly from the neutral instructions (c_1) ($F_{c_1c_2} = .001$, $F_{.95} = 3.98$). However, both the neutral (c_1) and the moderate (c_2) instructions differed significantly from the extreme ego-involving instructions (c_3) at the .05 level ($F_{c_1c_3} = 4.49$, $F_{.95} = 3.98$, and $F_{c_2c_3} = 4.33$, $F_{.95} = 3.98$). Therefore, the main effect of instructions may be attributed to the impact of the extreme instructions and not to the moderate instructions.

Third, the main effect for feedback is indeed significant ($p = .001$, $F = 43.07$, $F_{.999} = 11.60$). The DAF group takes much more time to read the paragraph (adjusted mean = 24.11 seconds) than the non-DAF group (adjusted mean = 18.06 seconds).

Fourth, there is no significant difference between high and low drive groups; that is, the drive groups did not respond differently across conditions ($F = 2.39$, $F_{.95} = 3.98$). Also, there were no significant interactions between drive and instructions nor between feedback and instructions.

Since the hypotheses included the prediction of a drive x instructions interaction, it is important and experimentally permissible to investigate the simple main effects within this interaction (Winer, 1962). It was found that low drive (LD) and high drive (HD) groups differed significantly on neutral (NI) and moderate (MI) instructions. The simple main effect of drive at neutral instructions was significant at the .05 level (F_D at NI = 5.68, $F_{.95} = 3.98$), while drive at moderate instructions had a $p = .001$ (F_D at MI = 12.55, $F_{.999} = 11.60$). Under extreme ego-involving instructions (XI) however, low and high drive groups did not differ significantly (F_D at XI = 2.62,

$F_{.95}=3.98$).

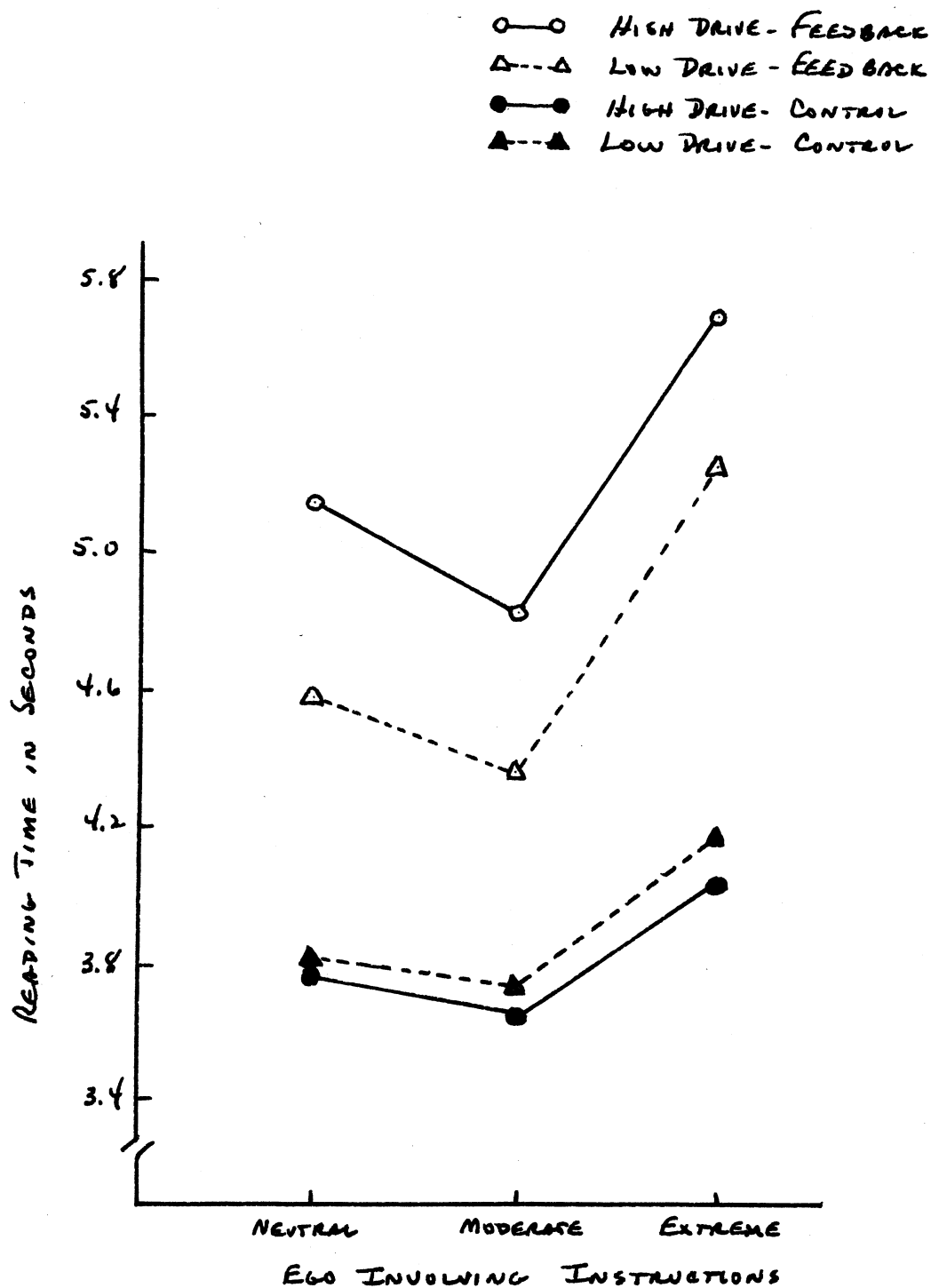
The analysis of covariance for the time necessary to read the fourth sentence revealed only one significant main effect and no significant interactions as presented in Table 4 and in Figure 2. The DAF condition produced poorer performance ($p=.005$) than the non-DAF, control condition ($F=20.36$, $F_{.995}=14.69$ using the Box test). The Box test was used to provide a conservative estimate of the F statistic since the variance was heterogeneous (Box, 1954). The verbalizations in the fourth sentence were analyzed further. The number of substitutions, repetitions and omissions were tabulated. Only forty-five per cent of the total number of subjects had any substitutions and only eighteen per cent had any omissions or repetitions. Since the distribution of frequencies within cells was not normally distributed, a chi square test was attempted in order to determine whether the frequency of the distortions significantly differentiated between groups. The chi square was found to be an inappropriate statistic, because more than twenty per cent of the expected values of the cells were less than 5.0 (Cochran, 1954). Therefore, cells were combined, according to Winer's (1962) suggestion, so that the expected values would be greater than 5.0. The cells were combined in the following manner: drive and feedback (DF); drive and instructions (DI); and feedback and instructions (FI). The chi squares of each of these combinations for the number of substitutions were not significant ($\chi^2_{DF}=.59$, $\chi^2_{DI}=1.33$, $\chi^2_{FI}=.29$, when $\chi^2_{.95}=5.99$). The omissions and repetitions for the drive and feedback combination were also not significant, using Fisher's exact probability test, since the expected values using the chi square test would have been under 5.0 ($p_{\text{omissions}}=.33$,

Table 4: Analysis of covariance of fourth sentence time as criterion and verbal intelligence as covariate for drive, instructions, and feedback.

	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Drive (D)	1.10	1	1.10	.61
Instructions (I)	8.56	2	4.28	2.39
Feedback (F)	36.45	1	36.45	20.36***
D x I	.15	2	.08	.04
D x F	6.92	1	6.92	3.87
I x F	1.17	2	.59	.33
D x I x F	.01	2	.01	.01
Error	182.46	102	1.79	

*** $p = .001$

FIGURE 2: ADJUSTED MEANS FOR FOURTH SENTENCE TIME



Repetitions⁻³³). In order to analyze the drive and instruction, as well as the feedback and instruction, combinations for omissions and repetitions, the data would have to be combined even further. The only appropriate statistic would be the Fisher exact probability test, but the test is used only with two population samples. The instruction variable, however, includes three samples; neutral, moderate and extreme instructions. Any combinations of the three levels would distort the data and confound the interpretation of results. In any case, by the statistical analyses that the data did permit, substitutions, omissions, and repetitions did not vary significantly between the experimental groups.

In summary, the most interesting finding is that high drive subjects perform more poorly than low drive subjects during DAF, but that high drive subjects do not differ significantly from low drive subjects during non-DAF conditions. Instructions which are extremely ego-involving gave rise to more distorted verbalizations. Also, DAF severely debilitated verbal behavior.

CHAPTER IV

DISCUSSION

This study has demonstrated that DAF debilitates verbal behavior for high drive subjects significantly more than low drive subjects. Another major finding is that instructions which strongly emphasize the subject's possible deviation from the performance of "most people" do significantly reduce the facility with which verbal behavior is elicited. The debilitating effect of DAF on verbal behavior certainly was not unexpected, since the literature consistently revealed speech disruption during DAF.

Spence (1963) points out that on simple tasks, that is, those having little intratask competition, high drive subjects generally perform better than low drive subjects. Conversely, on complex tasks, high drive subjects perform more poorly than low drive subjects. Therefore, the nature of the task utilized in experimental designs assigning subjects to groups on the basis of drive level is exceptionally important.

The tasks within this experiment may be considered to be dichotomized into simple and moderately complex. In the non-DAF condition, the subject simply reads the stimulus paragraph while wearing the same apparatus and being exposed to similar environmental cues as subjects in the DAF condition. Reading aloud by college students without gross speech or hearing defects, certainly is not a complex task. On the other hand, during the DAF condition the subject experiences auditory and verbal distortion, resulting from air conducted and kinesthetic auditory stimuli being presented in a confusing, unnatural manner. In order to resolve the confusion and the resultant speech distortion, the subject must place his concentrated

attention upon one stimulus. Thus, the task is not difficult conceptually, but is moderately difficult perceptually and motorically, since a completely new method of behaving must be learned.

The differences between the performance of high and low drive subjects on the simple (non-DAF) and the difficult (DAF) tasks were in the direction that would be predicted from drive theory and Child's (1954) response interference hypothesis. On the more difficult task, high drive subjects performed more poorly than did the low drive subjects. Child points out that not only are high drive subjects higher in drive level than low drive subjects, but they also exhibit irrelevant response tendencies with more frequency or with more intensity. These irrelevant response tendencies arise from drive stimuli which elicit such responses as anger, heightened autonomic reactivity, covert verbalizations reflecting self-deprecation, etc. Thus, the inferior performance of the high drive group during DAF may be attributed to the high susceptibility of high drive subjects to interference from irrelevant responses. Such an interpretation is particularly appropriate in this case, since Child emphasizes that tasks involving close attention and voluntary effort would allow more irrelevant responses to exist among high drive subjects. Speaking during DAF is a task which does seem to require both close attention and voluntary effort.

On the simple task (non-DAF) there was no significant difference between the performance of high and low drive subjects. This finding does not directly support Child's hypothesis. However, the similarity of the high to the low drive subjects might possibly be attributed to the presence of the electronic equipment and to the distracting influence it

might have created. That is, the high drive group should be more easily distracted by irrelevant stimuli, such as the earphones, the microphone, and the connecting wires, in addition to seeing the tape recording deck, the amplifier, the audiometer, and the timing clock when entering the experimental room. The increased number of possibilities to respond to irrelevant cues and the high drive subjects' tendency to respond to such cues perhaps diminished these subjects' ability to function effectively even on the simple, non-DAF task.

It is important to note that the significance of the main effect due to instructions is a result of the impact of the extreme, not of the moderate, condition. Perhaps the moderate instructions were not perceived as particularly threatening to the self-esteem of the subjects. However, the emphasis in the extreme condition upon the unusual, almost abnormal nature of those people who have difficulty speaking during DAF, had a definite and statistically significant impact upon the subjects. This impact may be considered to be a function of the ego-involvement that the instructions created. The extreme instructions suggested to the subjects that they may be somewhat abnormal, thereby increasing their desire to function normally on the proposed task. When they found it impossible to verbalize in their usual fashion, their self-concept was perhaps threatened and they experienced a good deal of discomfort. Spence (1963) suggests that mildly stressful conditions should lead to more persistent effort and attention and hence to improved performance. Anxiety is then aroused by the fear of failure and by the negative self-evaluation by the subject. As anxiety increases, the frequency of irrelevant responses also increases. Performance is thus debilitated. Sarason (1961) suggests a response interference interpretation

quite similar to that of Spence (1963).

The effect of DAF upon verbal behavior may also be conceptualized in terms of response interference. Since the usual pattern of auditory feedback is disrupted and since the subject has never experienced such a phenomenon, he must learn to speak by responding to a new set of sensory cues. That is, he must choose either the kinesthetic or the air-conducted sound as feedback information which enables him to speak. After this choice is made, the possibility of attending to the other feedback cue still exists. Having chosen the kinesthetic cue, for example, the subject may occasionally attend to the delayed air-conducted cue. This diversion of attention essentially produces response interference. In other words, the task-irrelevant stimuli create momentary difficulty in speaking or response interference. Perhaps the difficulty in speaking occurs when the perceptual feedback shifts in modality with the waxing and waning of attention within the subject.

Sarason and Palola (1960) found the MAS to be significantly related to the effects of instructions upon performance. Therefore, it was anticipated that there would be a significant interaction between the high drive group and instructions, that is, with high drive subjects being more reactive to the ego-involving instructions than the low drive subjects. This interaction effect was not found. Although there was no significant difference within the drive groups for the neutral and moderate instructions, both groups significantly decreased in the adequacy of their performance between the moderate and the extreme conditions (low drive: $p < .001$, high drive: $p < .01$). It seems then that the moderate instructions had very little impact upon performance, thereby contributing to the non-significance of the drive x instructions interaction. However, it is interesting to look at the simple

main effects for this interaction more closely. The difference between low and high drive subjects under neutral instructions was significant at the .05 level, under the moderate condition at the .01 level, while for the extreme condition the difference between drive groups was non-significant. The moderate ego-involving instructions did therefore produce a greater significant difference between drive groups ($p < .001$) than did the neutral instructions ($p < .05$). The increased significance between drive groups can be accounted for by the improved performance of the low drive subjects under moderate instructions even though the improvement within the low drive group is non-significant. That is, low drive subjects perhaps responded positively to the instructions and performed better when they became more ego-involved in the task. This finding is consonant with Spence's (1963) theory. It seems that the lack of an impact of the moderate instructions within groups contributed to the non-significance of the triple interaction of drive, instructions, and feedback.

The secondary dependent variables were those restricted to the fourth sentence of the stimulus paragraph. Although the time measures for the fourth sentence and the total time measures appeared quite similar graphically, the fourth sentence measures were far less significant. Only the feedback condition produced a significant effect ($p < .001$). The other dependent variables did not differentiate significantly between the experimental variables. These findings may perhaps be partially attributed to the short duration of behavior sampled in the fourth sentence. This interpretation is supported by the similarity of the graphic presentation of the total time and the fourth sentence time. The number of omissions, repetitions, and substitutions may also provide more significant results if a sample of longer

duration was utilized. However, because of the infrequent occurrence of these dependent variables in these data, it seems advisable to use only the time measures in future research, in addition to other possible dependent variables not utilized in this study. Since the duration of the speech sample appears to be an important factor, further research investigating the length of the stimulus material seems appropriate. Also, the possibility exists that more verbal distortion exists early in the reading of the paragraph than later. Therefore, it would be helpful to investigate at what point within the duration of the stimulus sample the most distortion occurs. One could ask whether or not subjects learn to deal with DAF and how quickly they learn. Such information would provide data regarding the ability of low and high drive subjects to adapt to the unusual experience of perceptual and motoric distortion produced by delayed auditory feedback.

In general, the response interference hypothesis of Child was helpful in interpreting the results of this study. Also, Spence's (1963) conceptions added to the theoretical relevance of the performance of high and low drive subjects under ego-involving conditions.

CHAPTER V

SUMMARY

This study investigated the effects of drive and ego-involving instructions upon verbal behavior during delayed auditory feedback. One hundred fifteen subjects were assigned to high and low drive groups according to scores on the Taylor MAS. Neutral, moderate and extreme levels of ego-involving instructions were used. The feedback condition included delayed as well as non-delayed auditory feedback. High drive subjects performed significantly more poorly than low drive subjects during delayed feedback. The extreme instructions significantly affected all verbal behavior. Verbal behavior during delayed auditory feedback was significantly debilitated. The response interference hypothesis was utilized in interpreting these results.

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APPROVAL SHEET

The thesis submitted by Donald Edward Fuhrmann has been read and approved by the members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

Jan 25, 1967
Date

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